CLAIMS

We claim:

1. For a router that uses a set of partitioning lines to partition a region of a design layout into a plurality of sub-regions, a method of pre-computing routes for nets, wherein a sub-region configuration is a set of sub-regions, and different sub-region configurations represent different sets of sub-regions, the method comprising:

    a)   identifying groups of related sub-region configurations;

    b)   for each group, storing a base set of routes;

    c)   for each particular configuration in each group, storing an indicia specifying how to obtain a related set of routes for the particular configuration from the base set of routes stored for the configuration's group.

2. The method of claim 1, wherein each group of sub-region configurations includes a base configuration and a plurality of symmetrical sub-region configurations each of which is related to the base configuration based on a particular symmetrical relationship.

3. The method of claim 2, wherein the stored indicia for the base sub-region configuration of each particular group specifies that the base set of routes stored for the particular group are the set of routes for the base sub-region configuration of the particular group.

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4.   The method of claim 3, wherein each route in the base set of routes of each particular group traverses the sub-regions of the base sub-region configuration of the particular group.

5.   The method of claim 3,

wherein the stored indicia for each particular symmetrical configuration of each particular group specifies a particular transformation of the particular group's base set of routes to the set of routes for the particular symmetrical configuration,

wherein each particular symmetrical configuration's specified transformation is based on the particular configuration's symmetrical relationship to the particular group's base configuration.

6.   The method of claim 5, wherein the transformation of at least one particular symmetrical configuration of each group specifies that the group's base set of routes has to be rotated about an origin by a particular angle to obtain the particular symmetrical configuration's set of routes.

7.   The method of claim 6, wherein the transformation of at least one particular symmetrical configuration of each group specifies that the group's base set of routes has to be rotated about an origin by a particular angle and then flipped about an axis to obtain the particular symmetrical configuration's set of routes.

8.   The method of claim 5, wherein the transformation of at least one particular symmetrical configuration of each group specifies that the group's base set of

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routes has to be flipped about an axis to obtain the particular symmetrical configuration's set of routes.

9.   For an electronic design automation ("EDA") router that routes nets within a region of an integrated-circuit layout, a method of pre-computing routes, the method comprising:

  a)   defining a set of partitioning lines for partitioning the region into a plurality of sub-regions, wherein different sets of sub-regions represent different sub-region configurations;

  b)   for a first sub-region configuration, identifying a first set of routes, wherein each route in the first set connects the first set of sub-regions;

  c)   identifying a second sub-region configuration that is symmetrical to the first sub-region configuration;

  d)   storing the first set of routes in a storage structure;

  e)   storing an indicia specifying how to obtain a second set of routes for the second sub-region configuration from the first set of routes stored for the first sub-region configuration.

10.   The method of claim 9, wherein the stored indicia specifies a symmetrical relationship between the first and second sub-region configurations.

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11.   The method of claim 9, wherein the stored indicia specifies that each route in the first set of routes needs to be rotated a particular angle to obtain a route in the second set of routes.

12.   The method of claim 9, wherein the stored indicia specifies that each route in the first set of routes needs to be flipped about an axis to obtain a route in the second set of routes.

13.   The method of claim 9 further comprising:

identifying other sub-region configurations that are symmetrical to the first sub-region configuration;

for each other sub-region configuration, storing an indicia specifying how to obtain a set of routes for the other sub-region configuration from the first set of routes stored for the first sub-region configuration.

14.   The method of claim 9 wherein storing the first set of routes comprises:

a)   determining whether each route in the first set is previously stored in the storage structure;

b)   when a particular route in the first set is previously stored in the storage structure, associating the stored particular route with the first and second sub-region configurations; and

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c)   when a particular route in the first set is not stored in the storage

structure, storing the particular route in the storage structure, and associating the stored

particular route with the first and second sub-region configurations.

15.   The method of claim 14, wherein associating the first and second set of

sub-region configurations with each route in the first set of routes comprises:

for the first and second set of sub-region configurations, storing a set of

references to routes,

wherein each reference in the set of references refers to one route in the

first set of routes.

16.   The method of claim 9, wherein the first set of routes includes only one

route.

17.   The method of claim 9, wherein the first set of routes includes more than

one route.

18.   For a router that uses a set of partitioning lines to partition a region of a

design layout into a plurality of sub-regions, a computer medium having a computer

program that pre-computes routes for nets, wherein a sub-region configuration is a set of

sub-regions, and different sub-region configurations represent different sets of sub-

regions, the computer program comprising:

a)   a first set of instructions for identifying groups of related sub-region configurations;

b)   a second set of instructions for storing, for each group, a base set of routes;

5   c)   a third set of instructions for storing, for each particular configuration in each group, an indicia specifying how to obtain a related set of routes for the particular configuration from the base set of routes stored for the configuration's group.

19.   The computer medium of claim 18, wherein each group of sub-region configurations includes a base configuration and a plurality of symmetrical sub-region configurations each of which is related to the base configuration based on a particular symmetrical relationship.

20.   The computer medium of claim 19,

wherein the stored indicia for the base sub-region configuration of each

15   particular group specifies that the base set of routes stored for the particular group are the set of routes for the base sub-region configuration of the particular group;

wherein each route in the base set of routes of each particular group traverses the sub-regions of the base sub-region configuration of the particular group; and

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wherein the stored indicia for each particular symmetrical sub-region configuration of each particular group specifies the symmetrical relationship between the particular symmetrical sub-region configuration and the particular group's base sub-region configuration.